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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,504	10/29/2003	Tetsuya Kobayashi	1324.68599	5768

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EXAMINER

MOON, SEOKYUN

ART UNIT	PAPER NUMBER
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2629

DATE MAILED: 09/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/696,504

Applicant(s)

KOBAYASHI ET AL.

Examiner

Seokyun Moon

Art Unit

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 July 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 and 22-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 16, 17 and 22-28 is/are rejected.
- 7) ☒ Claim(s) 7-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 2/2/04&6/7/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of **Group I** in the reply filed on July 19, 2006 is acknowledged.
2. **Claims 18-21** and **29-55** are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected groups, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on July 19, 2006.

### *Priority*

3. Applicant's claim for the benefit of prior-filed applications under 35 U.S.C. 119(a)-(d) is acknowledged.
4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Claim Objections*

5. **Claim 22** is objected to because of the following informalities: The term indicated as a previously disclosed term, "*the light source control system*" is not disclosed in claim 1.

As best understood by the Examiner, the claim limitation, "*the light source control system*" will be interpreted as "*a light source control system*" for further examination purpose.

### *Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2629

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 1, 2, 4, 5, 16, 17, and 22-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagatani (US Patent No. 6,977,642 B2).

As to **claim 1**, Nagatani teaches an illumination device for illuminating a display area of a liquid crystal display device [col. 2 lines 32-35], comprising:

at least one light source ("*fluorescent tube 46a*") [fig. 4] capable of changing light emission brightness ("*luminance*") [fig. 5];

at least one light-emitting area (a combination of "*light emitting parts 44A*" and "*light guide plate 40*") [fig. 3] for emitting light from the light source; and

a light source power supply circuit (a combination of "*power source*", "*oscillating circuit 54*", "*brightness control circuit 48*", and "*lighting control circuit 50a*") [fig. 4] for switching between a maximum lighting state in which the light source is made to emit light at a specified maximum brightness and an intermediate lighting state in which the light source is made to emit light at a specified intermediate brightness lower than the maximum brightness [fig. 5] [abstract lines 1-11].

Nagatani does not expressly disclose the liquid crystal display device to be an active matrix type.

However, Examiner takes official notice that it is well known in the art to implement an illumination device in an active matrix type liquid crystal display device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use Nagatani's illumination device as a backlight source for an active matrix type liquid crystal display device since active matrix type liquid crystal display devices are well known

for low power consumption and fast display refreshing time compared to passive matrix type liquid crystal display devices.

As to **claim 2**, Nagatani [fig. 3] teaches the light-emitting area (a combination of "*light emitting parts 44A*" and "*light guide plate 40*") to include a light emission opening (the space is opened for the light sources so that the lights transmitted from the plural light sources are transmitted to the space) to be used when the display area is illuminated and disposed substantially in parallel to an extension direction of a gate bus line (Nagatani's row electrodes which extend from the left side of the LCD to the right side in fig. 3) formed in the liquid crystal display device.

As to **claim 4**, Nagatani [fig. 5] teaches that the intermediate lighting state is set to have brightness level of 50% or less of a brightness level of the maximum lighting state.

As to **claim 5**, Nagatani [fig. 5] inherently teaches an illumination time in the maximum lighting state being a time of 50% or less of one frame period since Nagatani discloses the illumination time in the maximum lighting state is 50% of less of a duty ratio as shown for "

As to **claim 16**, Nagatani [fig. 4] teaches the light source power supply circuit (a combination of "*power source*", "*oscillating circuit 54*", "*brightness control circuit 48*", and "*lighting control circuit 50a*") including a brightness adjusting volume ("*brightness control circuit 48*") for adjusting brightness of emission light from the light-emitting area.

As to **claim 17**, the modified Nagatani as discussed with respect to the rejection of claim 1 teaches an active matrix type liquid crystal display device comprising the illumination device [col. 2 lines 32-35].

As to **claim 22**, Nagatani [fig. 3] teaches that the light-emitting area (a combination of "*light emitting parts 44A*" and "*light guide plate 40*") includes a plurality of the light sources ("*fluorescent tubes 46a, 46b, and 46c*"), and a light source control system ("*lighting control*

*circuit 50a*") [fig. 4] controls currents (by controlling the effective voltage applied to the "fluorescent tubes 46a, 46b, and 46c") fed to the plurality of the light sources [abstract lines 8-11], respectively, to switch between the maximum lighting state in which the light-emitting area is made to emit light at the maximum brightness and the intermediate lighting state in which the light-emitting area is made to emit light at the specified intermediate brightness lower than the maximum brightness [fig. 5].

As to **claim 23**, Nagatani teaches that the light source control system ("*lighting control circuit 50a*") [fig. 4] feeds a current (by applying a voltage) to at least one of the plurality of the light sources ("*fluorescent tubes 46a, 46b, and 46c*") so that the maximum lighting state (where the "*fluorescent tube 46a*" emits lights at the highest luminance, in fig. 5) occurs at a specified period and a non-lighting state (where the "*fluorescent tube 46a*" does not emit lights, in fig. 5) occurs at a time other than that, and feeds a current to the remaining light source ("*fluorescent tube 46c*") so that the non-lighting state (where the "*fluorescent tube 46a*" does not emit lights, in fig. 5) occurs at a time of the maximum lighting state (where the "*fluorescent tube 46c*" emits lights at the highest luminance, in fig. 5) and the intermediate lighting state occurs at a time other than that [fig. 5].

As to **claims 24, 25, 26, and 27**, Nagatani does not expressly disclose the light control system to feed a current to light sources in such ways as disclosed in the claims.

However, since each method of feeding a current to the light sources disclosed in each of the claims is not a required method of driving the illumination device, but one of plural alternative methods to be implemented in the LCD display device, it is an obvious matter of design choice to drive the illumination device in such ways disclosed in the claims.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nagatani's driving method for the illumination device in such ways, in order to provide various alternative combination of driving method for each of the light sources.

As to **claim 28**, all of the claim limitations have already been discussed with respect to the rejection of claim 17.

8. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagatani in view of Hirakata et al. (US Pub. No. 2002/0067332 A1, herein after referred to as "Hirakata").

Nakatani does not expressly disclose the light source power supply circuit to synchronize with one of gate pulses sequentially outputted to plural gate bus lines formed in the liquid crystal display device.

However, Hirakata [fig. 3] teaches a liquid crystal display device comprising a backlight source ("*light source 35*") of which the driving sequence is synchronized with the plural gate pulses ("*the scanning signal supplied to the gate signal line 3*") [par. (0402)].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nagatani's illumination device to synchronize with one of plural gate pulses, as taught by Hirakata, in order to prevent image degradation to be occurred in case the luminance of the light sources are changed after each of plural pixels are turned on by the plural gate pulses.

9. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagatani in view of Jeong et al. (US Pub. No. 2003/0198039 A1, herein after referred to as "Jeong").

Nakatani [fig. 3] teaches the illumination device comprising:

a first light source unit (a combination of "*fluorescent tube 46a*" and "*light guide plate 40*") including a light guide plate and a first light source disposed at an end thereof, for mainly illuminating a first light-emitting area and supplying part of light to an adjacent second light-emitting area; and

a second light source unit (a combination of “*fluorescent tube 46b*” and “*light guide plate 40*”) laminated on the first light source unit and including the light guide plate and a second light source disposed at an end thereof, for mainly illuminating the second light-emitting area and supplying part of light to the adjacent first light-emitting area.

Nagatani does not teach the illumination device to comprise a second light guide plate.

However, Jeong [fig. 11] teaches a liquid crystal display device comprising a plurality of light sources (“*first lamp 221a*” and “*second lamp 221b*”) and a plurality of light guide plates (“*224*”) [par. (0085) liens 12-13].

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Nagatani’s light guide plate section to be a plurality of light guide plates, as taught by Jeong, in order to provide various light paths for each of plural light sources, thus to optimize the brightness of the display.

#### ***Allowable Subject Matter***

10. **Claims 7-15** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant’s disclosure.

Han et al. (US Pat. No. 7,001,059 B2) teaches a LCD apparatus comprising a two-way backlight assembly emitting lights in two directions.



Katahira (US Pub. No. 2003/0063456 A1) teaches a LCD apparatus comprising a light guide device shaped like a wedge allowing the device to emit lights in two directions.

Takemoto (US Pub. No. 2001/0053072 A1) teaches a planar light source apparatus including a plurality of light sources and a plurality of illumination units wherein the plurality of light sources are arranged to illuminate edge portions of the plurality of illumination units.

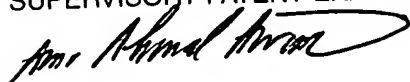
Hara et al. (US Pub. No. 2003/0067436 A1) teaches a LCD apparatus comprising a backlight device including a plurality of light sources and a plurality of light guide plates for each of the plural light sources.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seokyun Moon whose telephone number is (571) 272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AMR A. AWAD  
SUPERVISORY PATENT EXAMINER



September 13, 2006

S.M.